



Description

This new generation MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$), yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

Applications

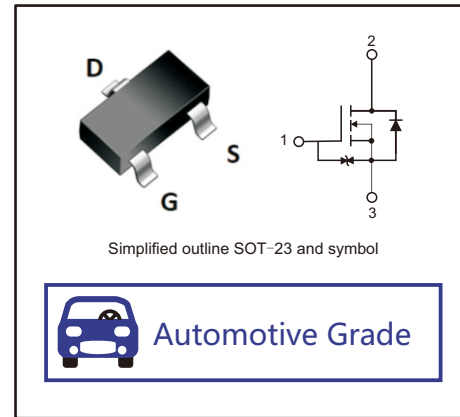
- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.

Features

- Low On-Resistance
- low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- ESD Protected Gate
- Totally Lead-Free & Fully RoHS Compliant (Note 1)
- Halogen and Antimony Free. "Green" Device (Note 2)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Capable (Note 3)

PINNING

PIN	DESCRIPTION
1	GATE
2	DRAIN
3	SOURCE



Mechanical Data

- Case: SOT-23
- Case Material: Molded Plastic.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-202
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating-Matte Tin Finish Annealed over Alloy 42 Leadframe).^③

Absolute Maximum Ratings (TA=25°C, unless otherwise specified)

Parameter	Symbols	Ratings	Units
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current	I_D	310	mA
Operation Junction Temperature And Storage Temperature	T_J, T_{stg}	-55 ~ +150	°C

Notes: 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. Halogen-and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br +Cl) and <1000ppm antimony compounds.
3. Automotive products are AEC-Q101 qualified and are PPAP capable.



Parameter Units	Symbols	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	B_{VDSS}	$V_{GS} = 0V, I_D = 250\mu A$	60			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = 60V, V_{GS} = 0V$			1	μA
Gate- Source Leakage Current	Forward	$V_{GS} = 20V, V_{DS} = 0V$			5	μA
	Reverse	$V_{GS} = -20V, V_{DS} = 0V$			-5	
On Characteristics						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2		2.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 0.115A$		2	3	Ω
		$V_{GS} = 5V, I_D = 0.115A$		2.5	4	Ω
HBM	ESD	$V_{DS} = 10V, I_D = 0.115A$	2.0			KV

Dynamic Characteristics

Input Capacitance	C_{ISS}	$V_{DS} = 25V,$ $V_{GS} = 0V,$ $f = 1.0MHz$		22		pF
Output Capacitance	C_{OSS}			3.2		pF
Reverse Transfer Capacitance	C_{RSS}			2.0		pF
Switching Characteristics						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD} = 30V, I_D = 0.115A,$ $R_L = 150\Omega, V_{GEN} = 10V,$ $R_{GEN} = 25\Omega$		2.7		ns
Turn-Off Delay Time	$t_{D(OFF)}$			12.6		ns



Typical Characteristics

Fig.1 Typical Output Characteristic

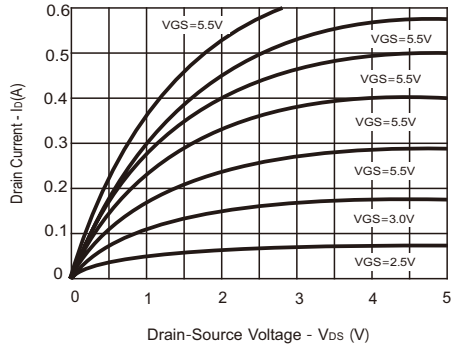


Fig.2 Typical Transfer Characteristics

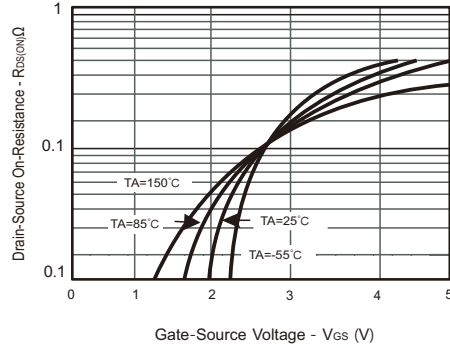


Fig.3 On-Resistance vs. Drain Current & Gate Voltage

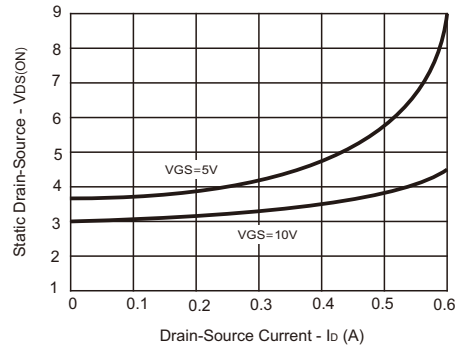


Fig.4 Normalized Static Drain-Source On-Resistance

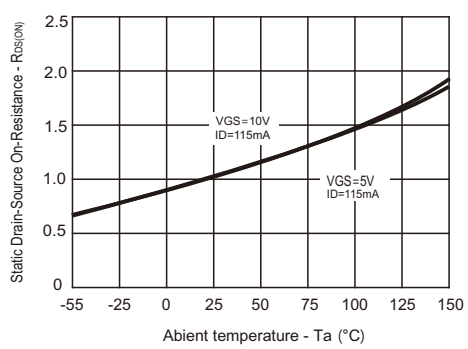


Fig.5 Gate Threshold Variation vs. Ambient Temperature

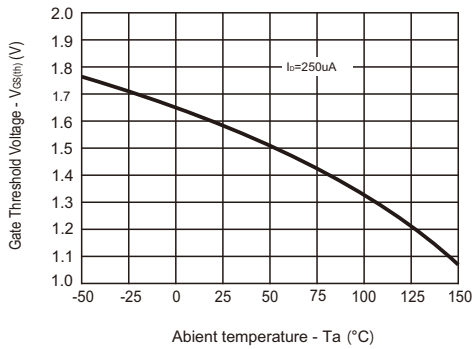


Fig.6 Typical Total Capacitance

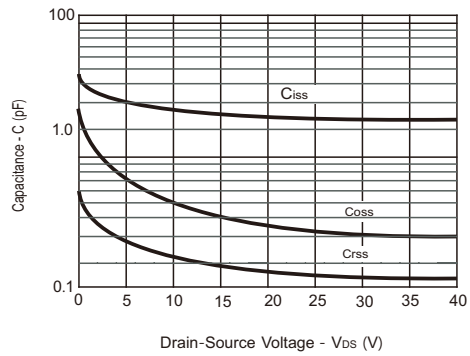
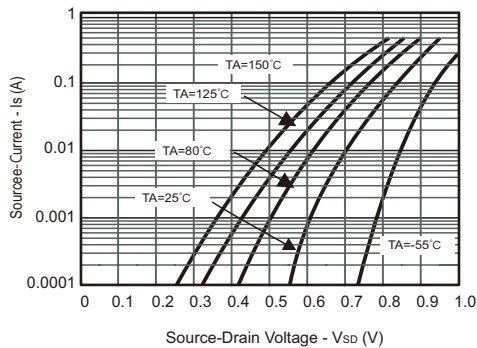
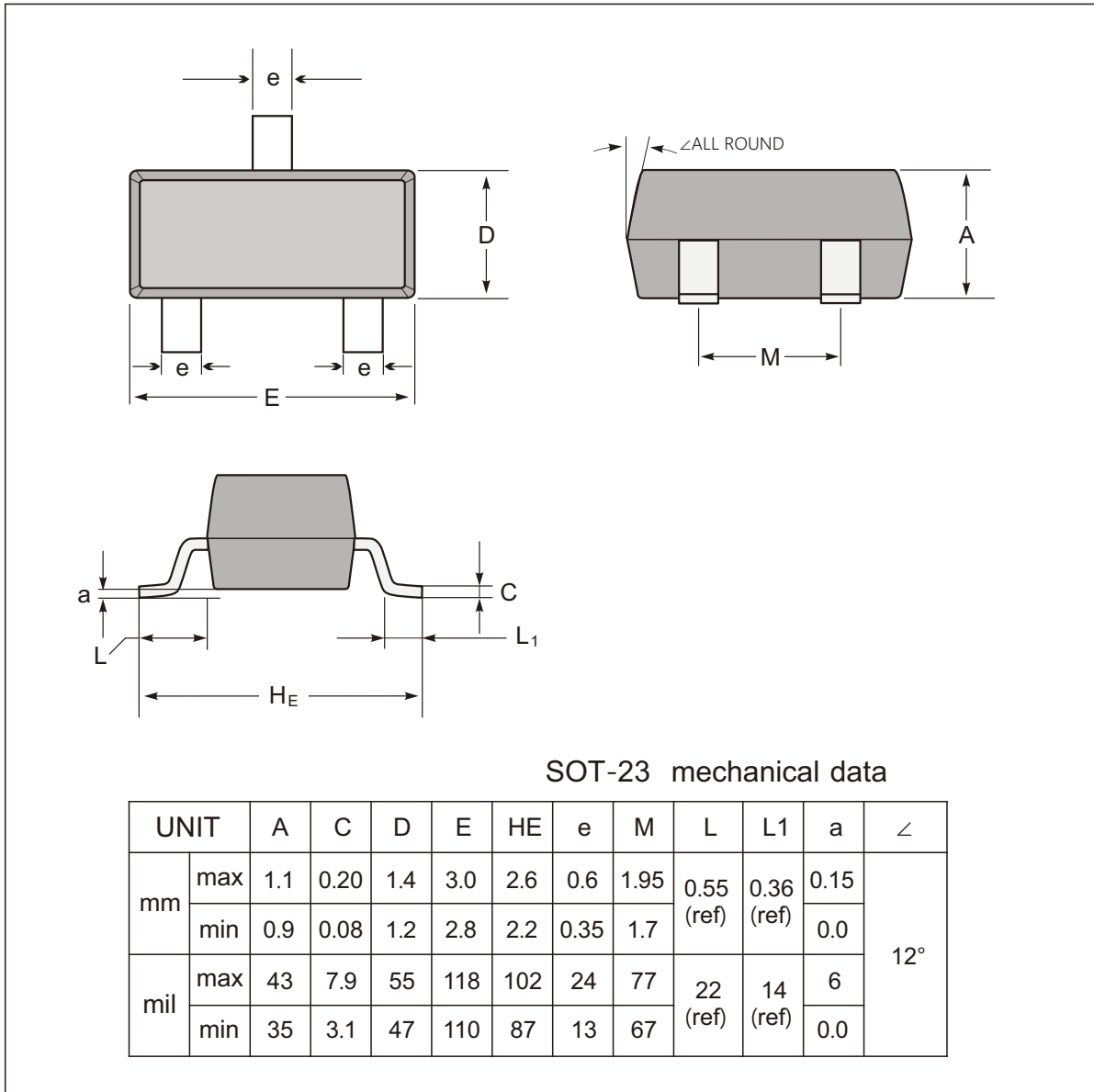


Fig.7 Reverse Drain Current vs. Source-Drain Voltage

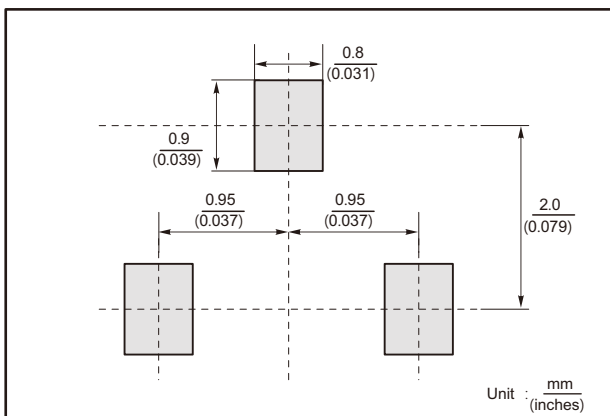




SOT-23 Package Outline Dimensions



The recommended mounting pad size



Marking

Type number	Marking code
2N7002AK	72AK



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